User's Manual

Protector® XLE Laboratory Fume Hoods

Models

9970400, 9970401, 9970500, 9970501, 9970600, 9970601, 9970700, 9970701, 9970800, 9970801

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Protecting your laboratory environment

LABCONCO®

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Please read the User's Manual before operating the equipment.

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Chapter 1: Introduction

Congratulations on your purchase of a Labconco Protector® XLE Laboratory Fume Hood. Your Protector XLE Fume Hood is designed to protect you. It is the result of Labconco's more than 50 years experience in manufacturing fume hoods, and users like you suggested many of its features to us.

The Labconco Protector XLE Fume Hood has been engineered to provide maximum visibility in a laboratory, and effectively contain toxic, noxious, or other harmful materials when properly installed. The Protector offers many unique features to enhance safety, performance, and visibility. To take full advantage of them, please acquaint yourself with this manual and keep it handy for future reference. If you are unfamiliar with how fume hoods operate, please review *Chapter 4: Performance Features and Safety Precautions* before you begin working in the fume hood. Even if you are an experienced fume hood user, please review *Chapter 5: Using Your Protector XLE,* which describes your Protector Hood's features so that you can use the hood efficiently.

About This Manual

This manual is designed to help you learn how to install, use, and maintain your laboratory fume hood. Instructions for installing optional equipment on your hood are also included.

Chapter 1: Introduction provides a brief overview of the laboratory fume hood, explains the organization of the manual, and defines the typographical conventions used in the manual.

Chapter 2: Prerequisites explains what you need to do to prepare your site before you install your laboratory fume hood. Electrical and service requirements are discussed.

Chapter 3: Getting Started contains the information you need to properly unpack, inspect, install, and certify your laboratory fume hood.

Chapter 4: Performance Features and Safety Precautions explains how the Protector operates and the appropriate precautions you should take when using the fume hood.

Chapter 5: Using Your Protector XLE discusses the basic operation of your fume hood. Information on how to prepare, use and shut down your Protector Hood are included.

Chapter 6: Maintaining Your Protector XLE explains how to perform routine maintenance on your fume hood.

Chapter 7: Modifying Your Protector XLE explains how to modify the fume hood or add accessories.

Chapter 8: Troubleshooting contains a table of problems you may encounter while using your laboratory fume hood including the probable causes of the problems and suggested corrective actions.

Appendix A: Protector XLE Components contains labeled diagrams of all of the components of the fume hoods.

Appendix B: Protector XLE Dimensions contains comprehensive diagrams showing all of the dimensions for the laboratory fume hoods.

Appendix C: Protector XLE Specifications contains the electrical requirements for laboratory fume hood. Wiring diagrams are also included.

Appendix D: References lists the various resources available that deal with laboratory fume hoods.

Typographical Conventions

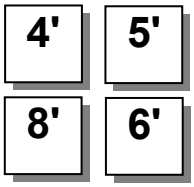
Recognizing the following typographical conventions will help you understand and use this manual:

- Book, chapter, and section titles are shown in italic type (e.g., *Chapter 3: Getting Started*).
- Steps required to perform a task are presented in a numbered format.
- Comments located in the margins provide suggestions, reminders, and references.

- Critical information is presented in boldface type in paragraphs that are preceded by the exclamation icon. Failure to comply with the information following an exclamation icon may result in injury to the user or permanent damage to fume hood.

- Critical information is presented in boldface type in paragraphs that are preceded by the wrench icon. These operations should only be performed by a trained certifier or contractor. Failure to comply with the information following a wrench icon may result in injury to the user or permanent damage to your hood.

- Important information is presented in capitalized type in paragraphs that are preceded by the pointer icon. It is imperative that the information contained in these paragraphs be thoroughly read and understood by the user.



- A number icon precedes information that is specific to a particular model of laboratory fume hood. The 4' icon indicates the text is specific to the 4-foot wide model. The 5' icon indicates the text is specific to the 5-foot model, etc.

- The S icon indicates the text is specific to the standard model.

- The A icon indicates the text is specific to the A-Style Combination Sash Model.

Your Next Step

If your Fume Hood needs to be installed, proceed to *Chapter 2: Prerequisites* to ensure your installation site meets all of the requirements. Then, go to *Chapter 3: Getting Started* for instructions on how to install your laboratory fume hood and make all of the necessary connections.

If you would like to review how laboratory fume hoods operate, go to *Chapter 4: Performance Features and Safety Precautions*.

For information on the operational characteristics of your laboratory fume hood, go to *Chapter 5: Using Your Protector XLE*.

If your laboratory fume hood is installed and you need to perform routine maintenance on the cabinet, proceed to *Chapter 6: Maintaining Your Protector XLE*.

For information on making modifications to the configuration of your fume hood, go to *Chapter 7: Modifying Your Protector XLE*.

Refer to *Chapter 8: Troubleshooting* if you are experiencing problems with your fume hood.

Chapter 2: Prerequisites

Before you install your laboratory fume hood, you need to prepare your site for installation. Carefully examine the location where you intend to install your hood. You must be certain that the area is level and of solid construction. In addition, a dedicated source of electrical power must be located near the installation site.

Carefully read this chapter to learn the requirements for your installation site:

- The location requirements.
- The support requirements.
- The exhaust requirements.
- The electrical power requirements.
- The service line requirements.
- The space requirements.

Refer to *Appendix B: Protector XLE Dimensions* for complete fume hood dimensions.

Refer to *Appendix C: Protector XLE Specifications* for complete laboratory fume hood electrical and environmental conditions, specifications and requirements.

Location Requirements

The fume hood should be located away from traffic patterns, doors, windows, fans, ventilation registers, and any other air-handling device that could disrupt its airflow patterns. All windows in the room should be closed.

Support Requirements

DO NOT install the fume hood on a cart, dolly, or mobile bench. ALL Protector Hood installations must be permanent and stationary. The supporting structure usually consists of a base cabinet or stand and chemically-resistant work surface.

Exhaust Requirements

The exhaust duct connection has been designed for 12" nominal duct (12.75" OD) to allow for minimum static pressure loss while operating at 100 fpm face velocities. The 12" diameter exhaust duct also allows for proper transport velocities away from the hood in the 1000 fpm to 2500 fpm range. The proper exhaust volume and static pressure loss are listed for each hood model:

		Latched Sash Full Open 28"		
Hood Size	**Standard Model Description**	**Face Velocity**	**Exhaust Volume**	**Static Pressure Loss**
4'	48" Protector XLE Hood	60 fpm	470 CFM	0.07" H_2O
		80 fpm	630 CFM	0.12" H_2O
		100 fpm	790 CFM	0.19" H_2O
5'	60" Protector XLE Hood	60 fpm	620 CFM	0.10" H_2O
		80 fpm	830 CFM	0.18" H_2O
		100 fpm	1040 CFM	0.28" H_2O
6'	72" Protector XLE Hood	60 fpm	770 CFM	0.12" H_2O
		80 fpm	1020 CFM	0.21" H_2O
		100 fpm	1280 CFM	0.33" H_2O
7'	84" Protector XLE Hood	60 fpm	920 CFM	0.07" H_2O
		80 fpm	1220 CFM	0.12" H_2O
		100 fpm	1530 CFM	0.19" H_2O
8’	96" Protector XLEHood	60 fpm	1070 CFM	0.08" H_2O
		80 fpm	1420 CFM	0.14" H_2O
		100 fpm	1780 CFM	0.22" H_2O

		Self-Closing 60% Sash Opening 18"		
Hood Size	**Standard Model Description**	**Face Velocity**	**Exhaust Volume**	**Static Pressure Loss**
4'	48" Protector XLE Hood	60 fpm	310 CFM	0.03" H_2O
		80 fpm	420 CFM	0.06" H_2O
		100 fpm	520 CFM	0.09" H_2O
5'	60" Protector XLE Hood	60 fpm	410 CFM	0.04" H_2O
		80 fpm	550 CFM	0.08" H_2O
		100 fpm	690 CFM	0.12" H_2O
6'	72" Protector XLE Hood	60 fpm	510 CFM	0.06" H_2O
		80 fpm	680 CFM	0.10" H_2O
		100 fpm	850 CFM	0.15" H_2O
7'	84" Protector XLE Hood	60 fpm	610 CFM	0.03" H_2O
		80 fpm	820 CFM	0.06" H_2O
		100 fpm	1020 CFM	0.09" H_2O
8’	96" Protector XLE Hood	60 fpm	710 CFM	0.04" H_2O
		80 fpm	940 CFM	0.06" H_2O
		100 fpm	1180 CFM	0.10" H_2O

Proper blower selection can be determined from these exhaust requirements and the total system static pressure loss. Contact Labconco Customer Service for assistance in sizing a blower system.

Electrical Requirements

The Protector Hood models feature internal wiring for the fluorescent light assembly and light switch. All internal wiring is terminated at the single point wiring junction box for hook-up by a qualified electrician. The blower switch, and light switch wires are also terminated at the single point wiring junction box for hook-up by a qualified electrician. Refer to *Chapter 3: Getting Started* and *Appendix* C*: Protector XLE Specifications* for the wiring diagram for proper electrical installation.

Service Line Requirements

All service lines to the laboratory fume hood should be a minimum of 1/4" outside diameter (3/8" diameter for a cold water gooseneck), copper (brass for natural gas), and equipped with an easily accessible shut-off valve, should disconnection be required. If the service line pressure exceeds 40 PSI, it must be equipped with a pressure regulator to reduce the line pressure. Please check with local codes for other requirements.

Space Requirements

The dimensions for the different models are shown in *Appendix B: Protector XLE Dimensions*.

Your Next Step

After you have determined that the location you have selected accommodates the installation and operational requirements of your fume hood, you are ready to begin installation. Proceed to *Chapter 3: Getting Started*.

Chapter 3:
Getting Started

Now that the site for your laboratory fume hood is properly prepared, you are ready to unpack, inspect, install, and certify your unit. Read this chapter to learn how to:

- Unpack and move your Protector Hood.
- Set up the fume hood with the supporting structure and work surface.
- Connect to an exhaust system.
- Connect the electrical supply source.
- Connect the service lines.
- Sealing the Protector Hood to the work surface.
- Arrange certification of your Protector Hood.

Depending upon which model you are installing, you may need common plumbing and electrical installation tools in addition to 5/16", 3/8", 7/16", and 1/2" wrenches, ratchets, sockets, a nut driver set, a flat-blade screwdriver, a Phillips screwdriver, and a carpenter level to complete the instructions in the chapter.

The Protector XLE Hood models weigh between 400 to 800 lbs. (182-363 kg). The shipping skid allows for lifting with a mechanical lift truck or floor jack. If you must lift the fume hood manually, follow safe-lifting guidelines. Normally, the fume hood can be slid off a hydraulic lift table and be placed into position on top of the work surface. Do not lift by the front air foil and trough assembly.

Unpacking Your Laboratory Fume Hood

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Carefully remove the shrink-wrap or carton on your fume hood and inspect it for damage that may have occurred in transit. If your unit is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.

DO NOT RETURN GOODS WITHOUT THE PRIOR AUTHORIZATION OF LABCONCO. UNAUTHORIZED RETURNS WILL NOT BE ACCEPTED.

IF YOUR HOOD WAS DAMAGED IN TRANSIT, YOU MUST FILE A CLAIM DIRECTLY WITH THE FREIGHT CARRIER. LABCONCO CORPORATION AND ITS DEALERS ARE NOT RESPONSIBLE FOR SHIPPING DAMAGES.

Do not discard the shipping skid or packing material for your fume hood until you have checked all of the components and installed and tested the unit.

Do not remove the fume hood from its shipping skid until it is ready to be placed into its final location. Move the unit by placing a flat, low dolly under the shipping skid, or by using a floor jack.

Do not move the hood by tilting it onto a hand truck.

Removing the Shipping Skid

LEAVE THE FUME HOOD ATTACHED TO ITS SHIPPING SKID UNTIL IT IS AS CLOSE TO ITS FINAL LOCATION AS POSSIBLE. MOVE THE HOOD BY USING A SUITABLE FLOOR JACK, OR BY PLACING A FURNITURE DOLLY UNDERNEATH THE SKID. DO NOT MOVE THE HOOD BY TILTING IT ONTO A HAND TRUCK.

After you verify the fume hood components, move your hood to the location where you want to install it. Should you require disassembly to move the hood, then follow the instructions in Appendix E. Then, follow the steps listed next to remove the shipping skid from your unit.

1. Remove the side panels by unscrewing the Phillips screws.

2. Find the hardware (bolts, washers, nuts) that attach the fume hood to the skid and remove the hardware. Some hardware is on the sides and some is on the back.

Sash Weight Release

To protect the fume hood from damage in shipment, the sash weight has been secured to the back of the fume hood with four (4) screws. Simply remove the screws and make sure the sash cables are on their respective pulleys before operation of the sash or damage could occur to the sash cable.

NOTE: THE SASH WEIGHT ITSELF WAS INDIVIDUALLY MATCHED FOR THIS SPECIFIC HOOD AND SHOULD NOT BE EXCHANGED ON ANY OTHER UNIT.

Install the Protector XLE Hood on a Supporting Structure and Work Surface

The Protector Hood is heavy! Use caution when lifting or moving the unit.

When installing the Protector Fume Hood onto a chemically-resistant work surface or benchtop, ensure that the structure can safely support the combined weight of the fume hood and any related equipment. The work surface should be at least as wide as the hood to properly support it. **The work surface is aligned flush with the back of the fume hood for good airflow: this will provide the correct spacing under the air foil for proper bypass airflow. The front edge of the trough assembly under the air foil should be located flush with front of the supporting base cabinet or stand.**

WARNING: It is important to support the rear of the work surface and fume hood. The cross support provides support for the bottom of the work surface. Install the cross support after the base cabinets and work surface are leveled and before installing the hood.

The following are instructions for mounting a cross support:

1. Level the base cabinets and the work surface. Work surface should be placed flush with the back of the fume hood as shown in Figure 3-1.
2. Scribe a line on the wall or back of the base cabinet to locate the support under the work surface.
3. Mount the support by attaching it to the wall or base cabinet.
4. Place the hood on top of the work surface and cross support.

The work surface should be smooth and durable, such as a chemically-resistant epoxy resin. The surface should be nonporous and resistant to the acids, solvents, and chemicals used in conjunction with the Protector Fume Hood. The work surface should also contain a dished recessed area for containing primary spills.

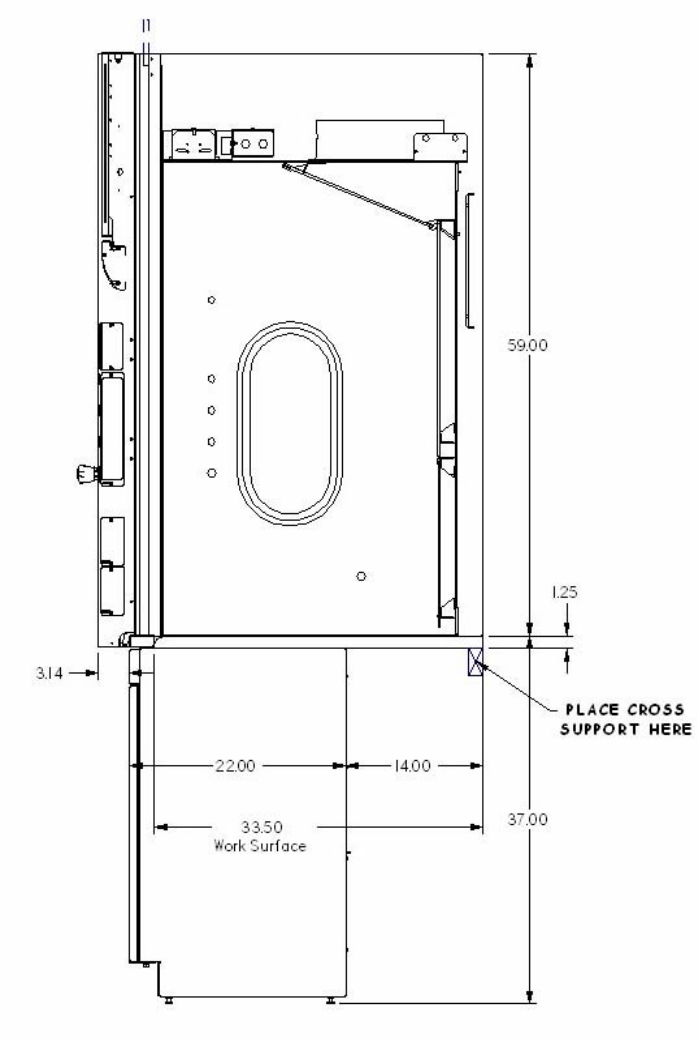


Figure 3-1

Connecting to the Protector XLE Hood Exhaust System

WARNING: The weight of the exhaust ductwork system must be supported independently of the hood superstructure. Do not allow this weight to be supported by the hood structure as damage to the hood may occur.

The exhaust connection should be installed by a qualified HVAC contractor.

The exhaust connection on your hood has been designed for 12" nominal pipe (12.75" OD) to allow for minimum static pressure loss with proper transport velocities away from the hood. Consult Labconco Customer Service should you require help sizing your blower for the exhaust volume and total system static pressure loss.

The selected exhaust duct material should match the hood procedures and chemicals used to ensure compatibility.

Connecting the Electrical Supply Source to the Protector XLE Fume Hood

Prior to connecting any electrical wiring to the fume hood structure, refer to the hood identification plate for the proper electrical requirements of your specific model.

WARNING: The building electrical supply system for Protector XLE Hoods should include overload protection. A switch or circuit breaker should be in close proximity to the equipment and within easy reach of the operator. The switch or circuit breaker is to be marked as the disconnecting device for the equipment. Consult the NEC-2002 for proper installation.

The identification plate, model number, serial number, and electrical connection boxes are accessible from the front of the fume hood by removing the front panel.

The Protector XLE Hood is normally wired for 115 Volt, 60 Hz, 20 Amp or 230Volt, 50 Hz, 10 Amp electrical service. Check the I.D. plate behind the front panel for voltage verification. The number of circuits varies depending on the model. All of the electrical connections are terminated at the single point internal junction box for hook-up by a qualified electrician. The single point internal junction box is used for the connection of the lights, blower, and duplex outlets. Refer to the wiring diagram for your Protector in *Appendix C: Protector XLE Specifications.*

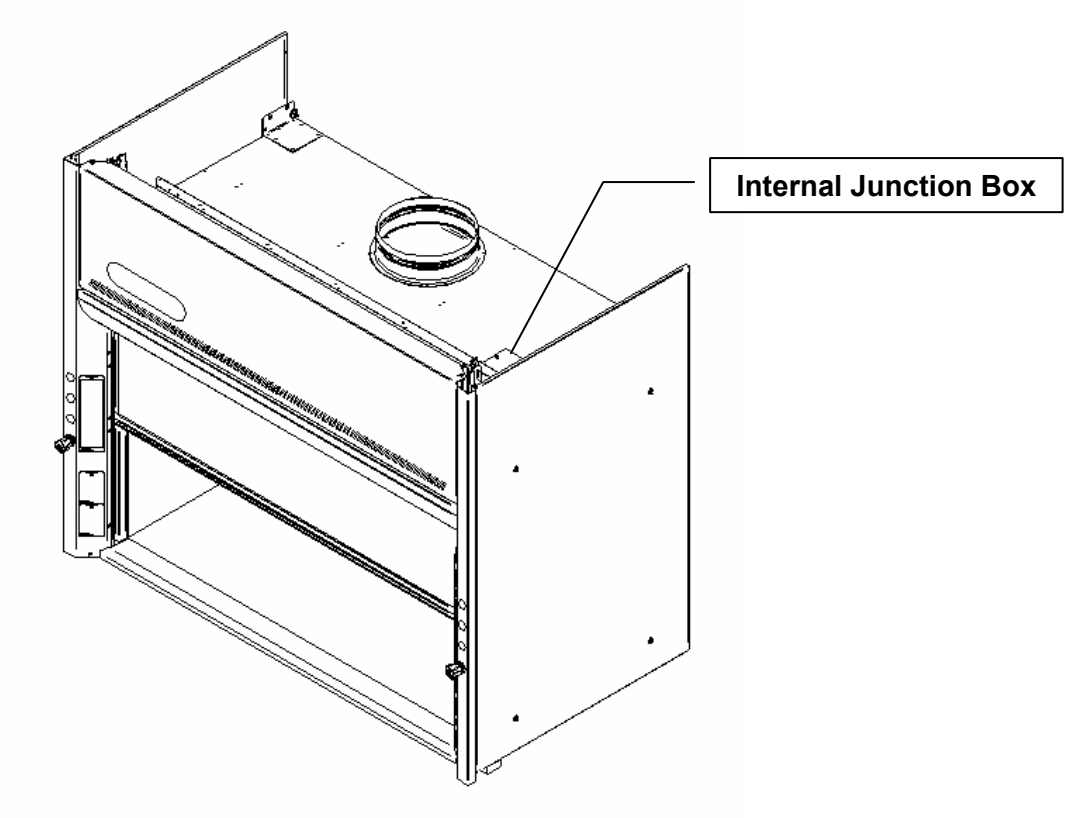


Figure 3-2

All wiring for the fume hood SHOULD be performed by a licensed electrician and conform to all local codes. In most cases, the hood will require the use of shielded conduit to protect the wiring into the hood. The grounding connection shall not be made to the terminal box cover.

The fluorescent light has been mounted outside the top liner panel and is sealed from vapors inside the hood structure. To change the fluorescent light bulbs in your hood, you must first remove the front panel from the hood. Next remove the knock out plugs holding the light fixture in place. Lift fixture up and replace any defective bulbs. Reverse order to reassemble.

Connecting the Service Lines to the Protector XLE Fume Hood

The hoods with service fixtures have been plumbed from the valve to the hose connector or gooseneck for your installation convenience. Supply tubing shall be provided by the qualified installer. Tubing can enter the hood from above, through the back, or through the work surface to make these connections to the service fixtures.

NOTE: Inspect all fittings for leakage. Tighten the fittings slightly if needed.

CAUTION: Do not use oxygen with any standard service fixture. Contact Labconco Customer Service for oxygen fixture information.

Should access to the hood plumbing fixture bodies be required, remove the service access plate on the hood front corner posts by loosening their individual screws. (See item 11 Figure A-1, page 48 and 49) The valve body will now be fully exposed for any service work that may be necessary. The service fixtures supplied on your laboratory hood are designed for use with the following services:

- Air
- Cold Water
- Hot Water
- Natural Gas – See caution below
- Vacuum

WARNING: Contact Labconco Customer Service directly before using any service other than those listed above in these valves to assure full compatibility.

CAUTION: Natural gas should be used only in the service fixture that has been pre-plumbed with brass tubing. Sulfur content of the gas could cause deterioration of standard copper supply lines.

Sealing the Protector XLE Fume Hood to the Work Surface

When the hood has been set in place, ducted, wired, and plumbed, it should be sealed at the work surface to prevent spilled materials from collecting under the walls of the hood. Materials such as silicone sealants are recommended to seal the hood structure.

Certifying the Protector XLE Fume Hood

The combination of your laboratory hood, exhaust ductwork, and exhaust blower gives you the flexibility to change the airflow at the sash opening of your hood. To determine the actual face velocity at the sash opening, airflow velocity readings will need to be taken. This should be done across the sash opening of the hood in accordance with the *Industrial Ventilation Manual* section on laboratory hoods. (See Appendix D – Reference) Labconco recommends an average face velocity at the sash opening of 80 to 100 feet per minute. Consult Labconco Customer Service for proper airflow volumes for your particular model.

Your Protector XLE Fume Hood has been tested at the factory per ASHRAE 110-1995. All hoods achieve an "as manufactured rating" of less than 0.10 part per million (ppm) at 4 liters per minute (lpm); AM<0.10 (consult Labconco for individual fume hood ratings). For "field use" ASHRAE testing contact Labconco Sales Engineering Team or Customer Service for a certified on-site contractor.

NOTE: Face velocity profiles and smoke testing should be done periodically to ensure safe performance.

Your Next Step

After your Fume Hood has been installed and certified, you are ready to proceed to *Chapter 4: Performance Features and Safety Precautions*.

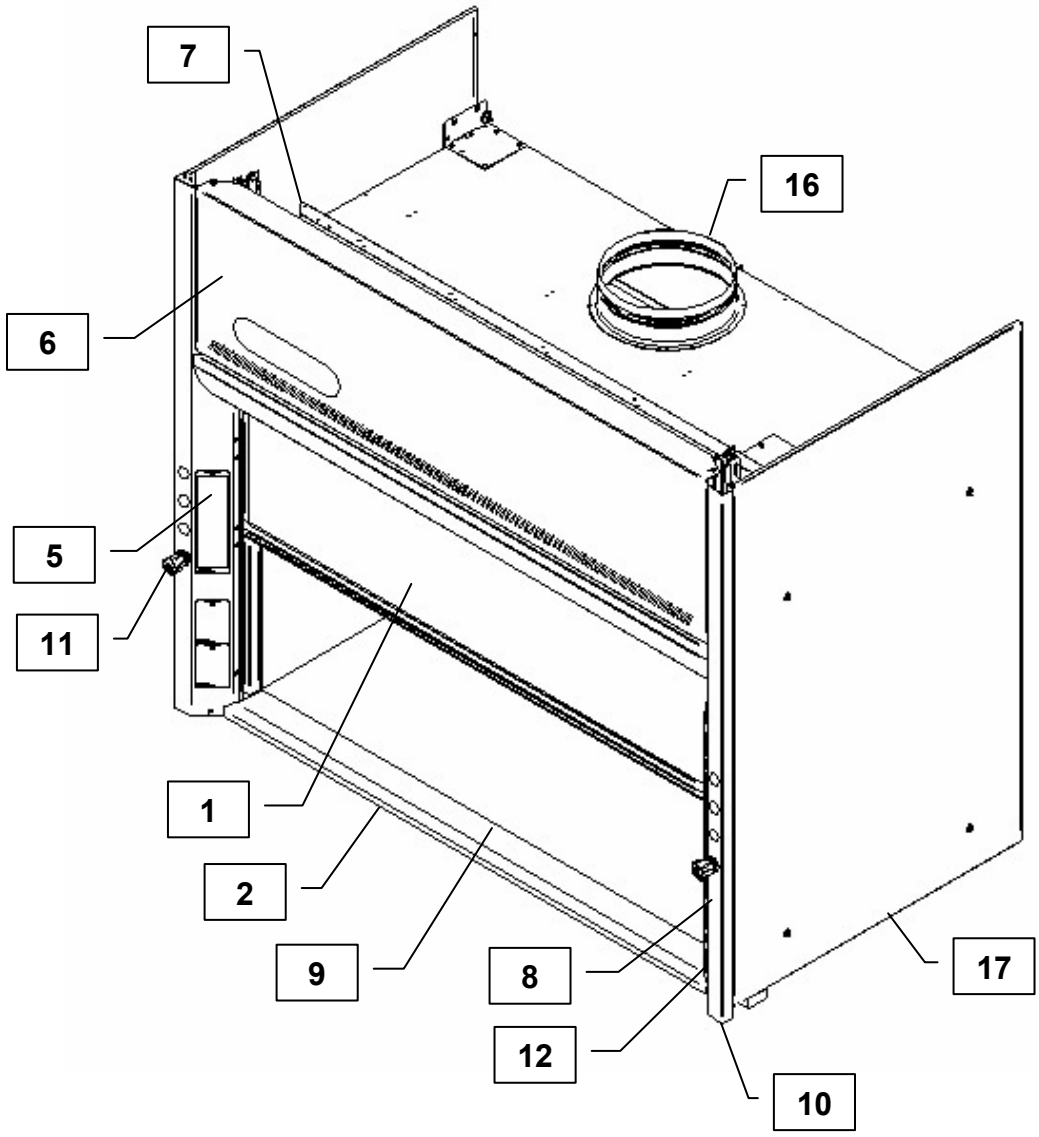
Chapter 4: Performance Features and Safety Precautions

Performance Features

The Protector® XLE Laboratory Fume Hood is designed to meet the needs of the laboratory scientist. The laboratory fume hood has been designed to effectively contain toxic, noxious, or other harmful materials when properly installed. A fully featured by-pass hood with baffle and air foil, this hood maintains safe airflow. Optional energy saving A-Style Combination Sash models are also available. The hood features by-pass airflow design that allows the hood face velocity to remain relatively stable as the sash is closed. Airflow is diverted behind the front panel and under the air foil to help control fluctuations in face velocity, which occur as the sash is closed.

1. **Unique sash provides maximum visibility of 35.00" high while conserving energy by limiting sash travel to 28"**. Vertical-rising sash may be raised from a closed position to 28" operating height. Optional sash stops are available to limit sash height and reduce energy usage. The sash can be locked open at the 28" height for loading and unloading operations. When the upper sash lock is released the sash will automatically lower to its designed operating height at 18". The sash can be lowered manually to any position lower than the 18" operating position.
2. **By-pass airflow design** ensures relatively stable face velocities.
3. **Large usable interior work depth and interior height of 48"** provides ample working space.

4. **Baffle** (not shown) directs airflow to the rear of the interior to provide efficient airflow. The baffle may be removed for cleaning purposes only.
5. **Exterior access cover plates** are removable for easy access to plumbing valves when access through the sides is not available.
6. **Lift-Away™ front panel** provides easy access to electrical wiring, sash weights, and lighting fixtures.
7. **Energy efficient fluorescent lighting** is located behind a laminated safety glass shield mounted to the top of the hood. The factory-wired instant start T8 lighting is serviceable from outside the hood cavity.
8. **Low mounted, factory-wired light and blower switches** are ADA compliant.
9. **Clean-Sweep™ Air Foil** allows air to sweep the work surface for maximum containment.
10. **Streamlined corner posts** provide maximum visibility and the flexibility to add services after installation.
11. **All hoods are factory prepared for up to 8 service fixtures**.
12. **Duplex electrical receptacles** are mounted on the right and left corner posts as requested. Receptacles are factory-wired to hood single point junction box (one on fixtured model).
13. **Shipped fully assembled** and eliminates the need for costly onsite assembly.
14. **Accessory Guardian™ Digital Airflow Monitor** or **Guardian Jr. Monitor** continuously monitors face velocity. An audio/visual alarm alerts the user to low airflow conditions. The right corner post is factory prepared to accommodate the Guardian Monitor (sold separately).
15. **Frame of epoxy-coated steel and aluminum** is durable and corrosion resistant.
16. **Exhaust Connection**. The hood features 12" (12.75" OD pipe) exhaust connections sized to allow for a minimum static pressure loss through the hood structure while providing a good transport velocity through the exhaust system.
17. **Spillstopper™ Solid Epoxy Work Surface** is dished to contain spills. (Work surface is sold separately).
18. **Optional Sash Stops** provide a means of controlling the operating height of the sash.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Safety Precautions

Although the laboratory hood has been engineered to maintain optimum operator safety, caution should always be used while working in the hood. Prior to using the hood, check to make sure that the exhaust blower is operating and that air is entering the hood at its specified face velocity.

USE GOOD HOUSEKEEPING IN THE HOOD AT ALL TIMES. CLEAN UP SPILLS IMMEDIATELY WITH A MILD DETERGENT. PERIODICALLY CLEAN HOOD INTERIOR, INCLUDING FLUORESCENT LIGHT GLASS PANEL. REPLACE BURNED OUT LIGHT BULBS TO MAINTAIN MAXIMUM ILLUMINATION.

DO NOT OVERLOAD THE WORK SURFACE WITH APPARATUS OR WORK MATERIAL. THE SAFE OPERATION OF THE LABORATORY HOOD IS BASED UPON HAVING PROPER AIRFLOW THROUGH THE STRUCTURE. DO NOT PLACE LARGE, BULKY OBJECTS SUCH AS BLOCK HEATERS, DIRECTLY ON THE HOOD WORK SURFACE. INSTEAD, ELEVATE THE OBJECT 2" TO 3" ON BLOCKS TO ALLOW A FLOW OF AIR UNDER THE OBJECT AND INTO THE LOWER REAR BAFFLE EXHAUST SLOT. ENSURE BLOCKS ARE LEVEL AND SECURED IN PLACE.

Blocking the bottom of the baffle at rear of hood will change the airflow pattern in the hood causing turbulence and possible leakage at the face of the hood. (Don't store containers or supplies against baffles, as this will affect airflow through the hood).

Avoid placing your head inside hood. Keep hands out of hood as much as possible.

Always work as far back in hood as possible. It is best to keep all chemicals and apparatus 6" inside the front of the hood.

This hood does not feature explosion-proof electrical components, unless ordered separately. Therefore, use of flammable or explosive materials in quantities above the explosive limit are not recommended.

Do not work with chemicals in this hood without the exhaust system running. Do not store chemicals in a fume hood.

Perchloric acid use in this hood is prohibited.

High level radioisotope materials are prohibited for usage in this hood.

DO NOT PLACE ITEMS ON THE AIRFOIL AS THEY WILL EFFECT THE HOODS ABILITY TO CONTAIN. AVOID CROSS DRAFTS AND LIMIT TRAFFIC IN FRONT OF THE HOOD. AIR DISTURBANCES CREATED MAY DRAW FUMES OUT OF THE HOOD.

The use of heat-generating equipment in this hood without the exhaust system operating properly can cause damage to the hood.

The Protector Laboratory XLE Hood should be certified by a qualified certification technician before it is initially used. The hood should be re-certified whenever it is relocated, serviced or at least annually thereafter.

Ensure that the unit is connected to electrical service in accordance with local and national electrical codes. Failure to do so may create a fire or electrical hazard. Do not remove or service any electrical components without first disconnecting the hood from electrical service.

Proper operation of the fume hood depends largely upon the hood's location and the operator's work habits. Consult the *Reference Manual in Appendix D.*

Your Next Step

After you understand the theory of operation and safety precautions, you are ready to proceed to *Chapter 5: Using Your Protector XLE*.

Chapter 5:
Using Your Protector XLE

S

Operating the Vertical-Rising Sash

Because of the Protector XLE Hood counterbalanced sash mechanism, it will take only a few pounds of force to move the sash up or down between the fully closed position and the 18" open position. You can operate the sash smoothly with one or two hands positioned any where along the handle. The vertical-rising sash may be raised to a maximum 28" operating height, but the sash will automatically close back to the 18" opening position unless locked in the full open position. The airflow requirements should be sized for the 18" operating height.

S A

Operating the Blower

Your Protector Fume Hood utilizes a remote style blower, which can be activated by turning the blower switch to "ON." You can validate the hood performance by watching smoke drawn into the hood face opening.

S A

Operating the Lights

Your Protector Fume Hood utilizes a factory-wired fluorescent light to illuminate the hood interior. Simply turn the light switch to "ON" to operate.

Working in Your Protector XLE

Planning

- Thoroughly understand procedures and equipment required before beginning work.
- Arrange for minimal disruptions, such as room traffic or entry into the room while the hood is in use.

Start-up

- Turn on fluorescent light and hood blower.
- Slowly raise the sash to the 18" sash height position.
- Check the baffle air slots for obstructions.
- Allow the hood to operate unobstructed for 5 minutes.
- Wear a long sleeved lab coat and rubber gloves. Use protective eyewear. Wear a protective mask if appropriate.

Loading Materials and Equipment

- Lock the sash in the upper position to load materials. Do not overload the hood.
- Do not obstruct the front air foil, or rear baffle slots.
- Large objects should not be placed close together and spaced above the work surface to permit airflow to sweep under the equipment.
- After loading the hood, wait one minute to purge airborne contaminants from the work area.
- Release sash stop and allow sash to return to the 18" opening.

Work Techniques

- Keep all materials at least 6 inches inside of the sash, and perform all contaminated operations as far to the rear of the work area as possible.
- Segregate all clean and contaminated materials in the work area.
- Avoid using techniques or procedures that disrupt the airflow patterns of the hood.

Final Purging

- Upon completion of work, the hood should be allowed to operate for two to three minutes undisturbed, to purge airborne contaminants from the work area before shutting down blower.

Unloading Materials and Equipment

- Objects in contact with contaminated material should be surface decontaminated before removal from the hood.
- All open trays or containers should be covered before being removed from the hood.

Shutdown

- Turn off the fluorescent light and hood blower, then close the sash.

Your Next Step

After you understand how to operate and work in the fume hood, you are ready to proceed to *Chapter 6: Maintaining Your Protector XLE.*

Chapter 6:
Maintaining Your Protector XLE

Now that you have an understanding of how to work in the fume hood, please review the suggested maintenance schedule and the common service operations necessary to maintain your fume hood for peak performance.

Only trained and experienced certification technicians should perform some of the service operations after the fume hood has been properly decontaminated. DO NOT attempt to perform these operations if you are not properly trained. The wrench icon precedes the service operations that require qualified technicians.

Routine Maintenance Schedule

Weekly

- Using ordinary dish soap to clean the surface inside of the fume hood, and the work surface.
- Using an appropriate glass cleaner, clean the sash and all glass surfaces.
- Operate the fume hood blower, noting the airflow velocity through the hood using a source of visible smoke.

Monthly (or more often as required)

- Determine the actual face velocity through the sash opening of the hood where the average reading should be at the specified velocity. (Use calibrated thermal anemometer or other approved apparatus).
- Using a damp cloth, clean the exterior surfaces of the hood, particularly the front of the hood, to remove any accumulated dust.
- Check all service valves, if so equipped, for proper operation.

- The hood baffles should be checked for blockages behind them to ensure that the hood is maintaining proper airflow.
- All weekly activities.

Annually

- Replace the fluorescent lamps.
- Have the fume hood recertified by a qualified certification technician. See *Certifying the Protector XLE Fume Hood in Chapter 3*.
- All monthly activities.

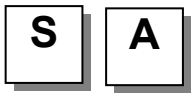
Biannually

- The sash assembly should be checked to ensure proper operation and to make sure there are no signs of abnormal wear on the sash pulleys, cables and clamps.

Routine Service Operations

Front Panel Removal:

1. Simply lift the front panel up and then away from the hood to provide access to the top.



Changing the Fluorescent Lamp:

1. Turn light switch to "OFF."
2. Remove the front panel as noted earlier.
3. Reach over the front header of the hood and remove the knock out plugs at both ends of fixture. Lift fixture up.
4. Remove the fluorescent lamp by pushing it out of the spring-loaded lamp socket and swinging it out of the other lamp socket.
5. Install the new lamp by reversing the removal procedure.

Your Next Step

After you understand the maintenance procedures, you are ready to proceed to *Chapter 7: Modifying Your Protector XLE*.

Chapter 7:
Modifying Your Protector XLE

There are several ways to modify the fume hood for your individual requirements. These include the addition of work surfaces, service fixtures, air monitor, distillation grids, electrical duplex receptacles and ceiling enclosures.

Installing Work Surfaces

Your Protector XLE Fume Hood requires a work surface to work properly. Contact Labconco Customer Service for ordering information.

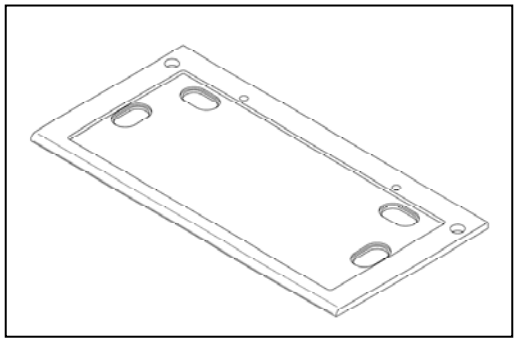


Figure 7-1

Installing Ceiling Enclosures Above the Fume Hood

Your Protector XLE Fume Hood has mounting holes to accept a ceiling enclosure to close off the area between the top of the hood and the ceiling. Contact Labconco Customer Service for ordering information.

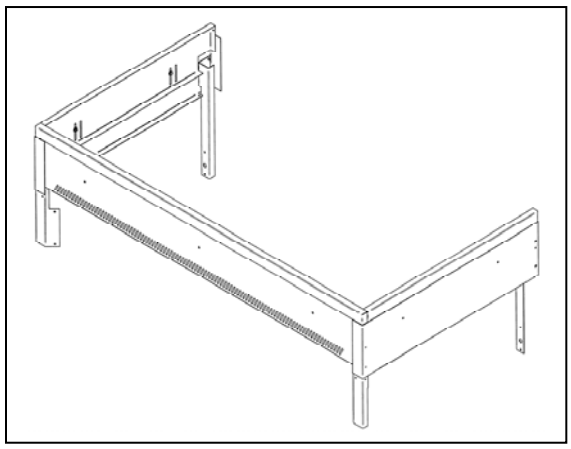


Figure 7-2

Installing Additional Service Fixtures

Additional service fixtures can be installed in the available service fixture holes in both sidewalls and corner posts. The fume hood is factory set to accept up to four valves per side. Contact Labconco Customer Service for information.

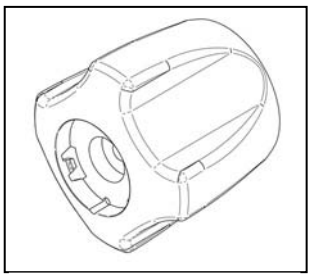


Figure 7-3 - Knob

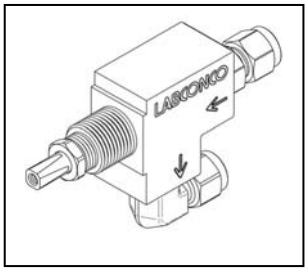


Figure 7-4 - Valve

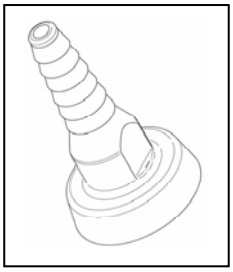


Figure 7-5 – Hose Connector

Installing Guardian™ 1000 Digital Airflow Monitor or Guardian™ Jr. Airflow Monitor

The Guardian Digital Airflow Monitor P/N 9743211 continuously monitors face velocity through the fume hood opening. The Guardian Jr. Airflow Monitor P/N 9743202 continuously monitors airflow through the exhaust. The fume hood right corner post is factory prepared to mount either monitor. Contact Labconco Customer Service to order.

Figure 7-6

Figure 7-7

Distillation Grids – Field Installation

The distillation grid P/N's 9725200 thru 9725206, have been strategically placed with the vertical rod center lines in front of the lower baffle and middle baffle. The distillation grids allow the hood user to mount glassware, motors, stirrers, and other apparatus. Contact Labconco Customer Service for ordering information.

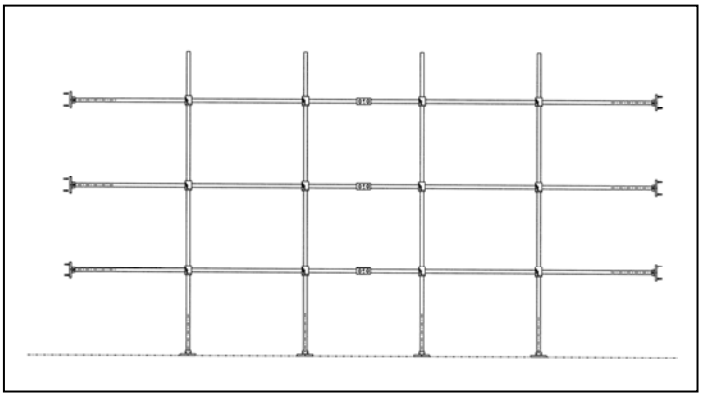


Figure 7-8

Installing an Electrical Duplex Receptacle

Your Protector Fume Hood can be ordered with duplex outlets, however, if you ordered a model without an electrical duplex outlet you can have one installed in the field by a qualified electrician. Contact Labconco Customer Service for ordering information. (Not acceptable on explosion-proof hoods).

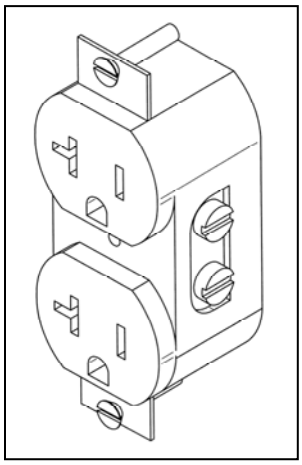


Figure 7-9

Your Next Step

After you understand the modifying procedures, you are ready to proceed to *Chapter 8: Troubleshooting*.

Chapter 8: Troubleshooting

Refer to the following table if your fume hood fails to operate properly. If the suggested corrective actions do not solve your problem, contact Labconco for additional assistance.

PROBLEM	CAUSE	CORRECTIVE ACTION
Remote blower and lights won't operate	Wires not connected at junction boxes or switches.	Check connection of switches.
		Check connection to control box on top of unit.
	Circuit breakers tripped in building electrical supply.	Reset circuit breakers.
Remote blower won't operate, but lights work	Blower wiring is disconnected.	Inspect blower wiring and switch.
	Belt broken.	Replace belt.
	Blower motor is defective.	Replace blower motor.
Fume hood blower operates but lights will not operate	Lamp wiring is disconnected.	Inspect lamp wiring.
	Defective lamp ballasts.	Replace lamp ballasts.

PROBLEM	CAUSE	CORRECTIVE ACTION
Contaminants outside of fume hood	Improper user techniques for the fume hood.	See "Certifying the Hood" Chapter 3 and "Safety Precautions" Chapter 4 sections in the manual. (Ref. Appendix D)
	Restriction of the baffle air slots or – blockage of the exhaust outlet.	Remove baffles to check that all air slots, and the exhaust outlet are unobstructed. Replace baffles.
	External factors are disrupting the fume hood airflow patterns or acting as a source of contamination.	See "Location Requirements" Chapter 2, "Certifying the Hood" Chapter 3, and "Safety Precautions" Chapter 4 sections of this manual. (Ref. Appendix D)
	Fume hood has improper face velocity.	Have fume hood re-certified and check remote blower exhaust system. Hood should have average face velocity of 80-100 fpm.
Vertical sash no longer operates smoothly	Cable is frayed or plastic protection is damaged.	Inspect cable and replace cable if worn or damaged immediately; otherwise injury could result.
	Pulley bearing is damaged.	Replace pulley, bearing or add grease.
	Cable has slipped off the pulleys.	Re-install, cable must be replaced immediately if damaged.
	Weight has broken pulleys.	Replace weight pulleys.
	Spring assembly.	Inspect to make sure spring is still attached to he sash.
Electrical duplex receptacles no longer have power	Wires not connected or faulty duplex.	Check wire connection or replace duplex.
	Circuit breakers tripped in building electrical supply.	Reset circuit breakers.

PROBLEM	CAUSE	CORRECTIVE ACTION
Service valves no longer operate	Faulty building supply.	Inspect building supply shut off valves and appropriate pressures below 40 PSI.
	Valve no longer operates.	Replace valve and check for leaks.
	Supply line or outlet line has leaks.	Inspect line for leaks and fix any leaking plumbing connections.

Appendix A:
Protector XLE Components

Illustration A-1 indicates the location of the following service parts:

Protector XLE Replacement Parts

Item	Quantity	Part No.	Description
1A	1	9823700	Valve, Labconco (Water) 1/4" Compression Fitting
1B	1	9823701	Valve, Labconco (Water) 3/8" Compression Fitting
1C	1	9817000	Valve, Labconco 1/4" Compression Fitting (AIR, GAS, VAC, NIT, etc.)
1D	1	9817001	Valve, Labconco 3/8" Compression Fitting (AIR, GAS, VAC, NIT, etc.)
1E	1	9823702	Valve, Labconco Deionized 1/4" Compression Fitting
1F	1	9823703	Valve, Labconco Deionized 3/8" Compression Fitting
1G	1	9818000	Nut, Valve Mounting. (Labconco)
2A	1	9826800	WaterSaver Valve/Gooseneck -GRN
2B	1	9826801	WaterSaver Valve/Connector (VAC) – YEL
2C	1	9826802	WaterSaver Valve/Connector (AIR) – ORG
2D	1	9826803	WaterSaver Valve/Connector (GAS) – BLU
2E	1	9826805	WaterSaver Valve/Connector (HOT WATER) – RED
2F	1	9826806	WaterSaver Valve/Connector (CW) – GRN
2G	1	9826807	WaterSaver Valve/Connector (STEAM) – BLK
2H	1	9826808	WaterSaver Valve/Connector (NITROGEN) – BRN
2I	1	9826809	WaterSaver Valve/Connector (OXYGEN) – LIGHT GREEN
2J	1	9826810	Swivel Gooseneck only – GRN
2K	1	9826812	Swivel Gooseneck only – WHITE
3	1	9818700 thru 08	Knobs (GRAY, GRN, BLU, ORG, YEL, RED, WHT, BLK, BRN)
4A	1	9818800	Hose Barb, GRAY – (NEUTRAL OR ARGON) – NOT SHOWN
4B	1	9818801	Hose Barb, GREEN - (COLD WATER) – NOT SHOWN
4C	1	9818802	Hose Barb, BLUE – (GAS) – NOT SHOWN
4D	1	9818803	Hose Barb, ORANGE – (AIR) – NOT SHOWN
4E	1	9818804	Hose Barb, YELLOW – (VACUUM) – NOT SHOWN
4F	1	9818805	Hose Barb, RED – (HOT WATER) – NOT SHOWN
4G	1	9818806	Hose Barb, WHITE – (DEIONIZED WATER) – NOT SHOWN
4H	1	9818807	Hose Barb, BLACK – (NEUTRAL OR STEAM) – NOT SHOWN
4I	1	9818808	Hose Barb, BROWN – (NITROGEN) – NOT SHOWN
4J	1	9819000	Nut, Hose Barb – NOT SHOWN
5	1	9825500	Label, Knob (contains all the labels)
6	1	9818900	Lens, Knob
7A	1	9947100, 01, 02	115V Duplex Receptacle (GRAY) Right, Left 4' - 6', Left 8' w/ wires
7B	1	9818200	Cover Plate 115V Duplex
7C	1	9947103, 04, 05	115V GFCI Duplex Receptacle (GRAY) Right 4' - 6', Left 8' w/ wires
7D	1	9818100	Cover Plate, 115V GFCI
7E	1	9818300	Cover Plate, Blank

Item	Quantity	Part No.	Description
8A	1	9721901	Lamp, Fluorescent (T8 x 3') – use on 4' & 8' Hoods – NOT SHOWN
8B	1	9721900	Lamp, Fluorescent (T8 x 4') – use on 5', 6' & 7' Hoods – NOT SHOWN
10A	1	1302300	Switch, Rocker
11A	1	9818400	Access Cover
11B	1	9825100	Label, Access Cover (includes all three corner labels)
12B	1	9810801	Side Panel, 30" internal deep hoods
12D	4	1916400	Nut, Retainer #10-24
12E	4	1885512	Screw, Machine #10-24 x .75 Truss Head Stainless
13A	1	9951000	Air Foil 4' Assembly with trough
13B	1	9951001	Air Foil 5' Assembly with trough
13C	1	9951002	Air Foil 6' Assembly with trough
13D	1	9951009	Air Foil 7' Assembly with trough
13E	1	9951003	Air Foil 8' Assembly with trough
14	4	1861400	Pulley, Front or Rear, 1-3/16 Dia. (rear of 4', 5', 6' only) – NOT SHOWN
15	2	4949902	Cable, Sash 130" – NOT SHOWN
16	2	9741900	Sheave, (Rear 8')
17	4	9742100	Bronze Bearing, Flanged Rear – NOT SHOWN
18	4	1920100	Clamp, Cable Replacement – NOT SHOWN
19	2	1972100	S-Hook – NOT SHOWN (to attach weight to cable)
20A	1	9946300	Wiring Harness, Main
21	1	9961500, 01, 02, 03, 04	Front Panel, 4', 5', 6', 7', 8'

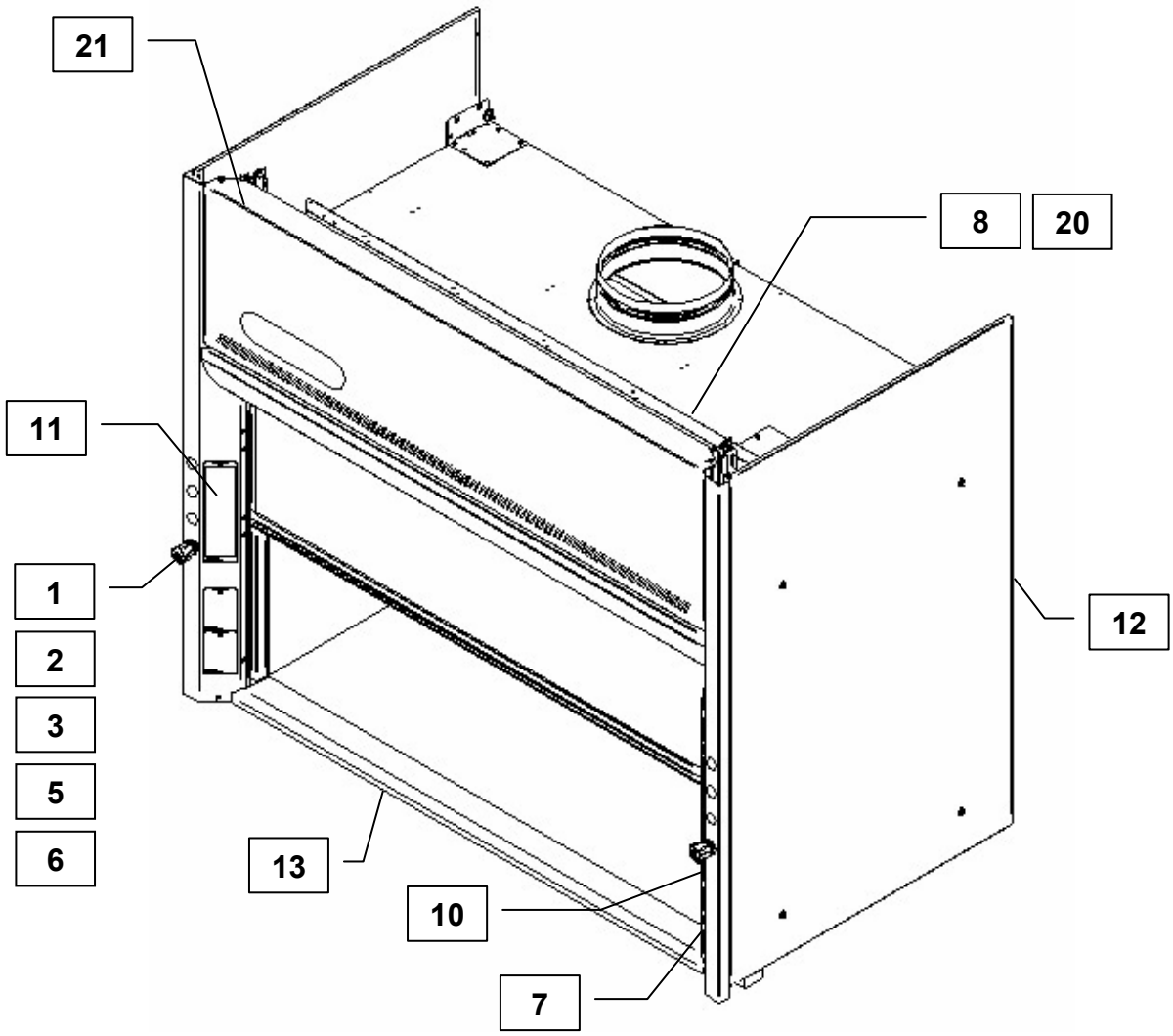
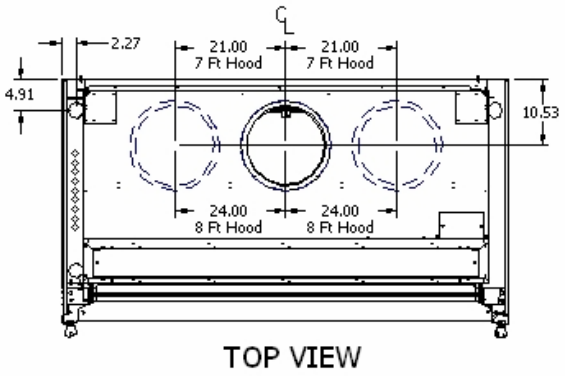


Figure A-1

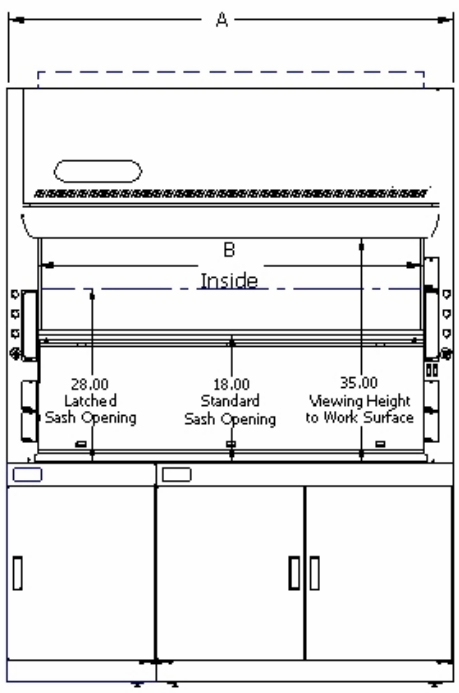
Appendix B:
Protector XLE Dimensions

XLE Model Widths

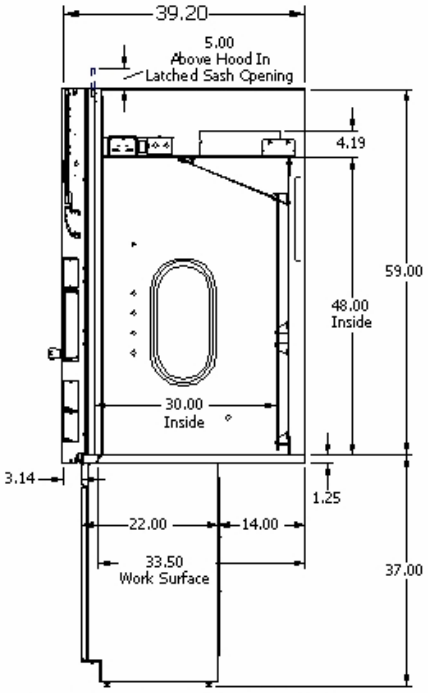
	4'	5'	6'	7'	8'
A	48.00	60.00	72.00	84.00	96.00
B	38.25	50.25	62.25	74.25	86.25
Duct Spacing	C/L One Duct	C/L One Duct	C/L One Duct	42.00 Two Ducts	48.00 Two Ducts



TOP VIEW



FRONT VIEW

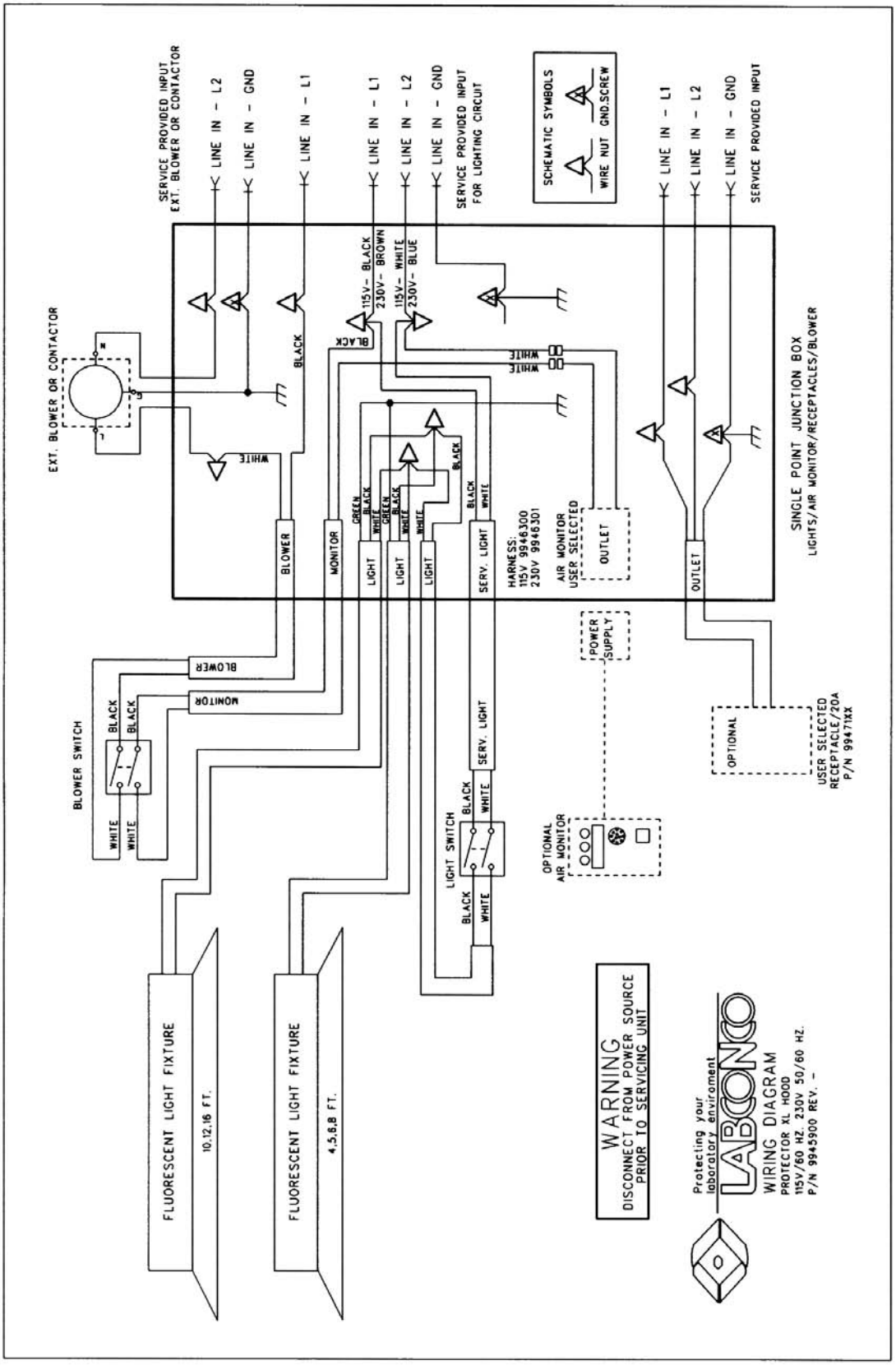


SECTIONAL SIDE VIEW

Appendix C:
Protector XLE Specifications

Environmental Conditions

- Indoor use only.
- Maximum altitude: 10,000 feet (3,048 meters).
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed ±10% of the nominal voltage.
- Transient over-voltages according to Installation Categories II (Over-voltage Categories per IEC 1010). Temporary voltage spikes on the AC input line that may be as high as 1500V for 115V models and 2500V for 230V models are allowed.
- Used in an environment of Pollution degrees 2 (i.e., where normally only non-conductive atmospheres are present). Occasionally, however, a temporary conductivity caused by condensation must be expected, in accordance with IEC 664.


SERVICE PROVIDED INPUT
EXT. BLOWER OR CONTACTOR
LINE IN - L2
LINE IN - GND
LINE IN - L1
LINE IN - L1
LINE IN - L2
LINE IN - GND
SERVICE PROVIDED INPUT
FOR LIGHTING CIRCUIT
SCHEMATIC SYMBOLS
WIRE NUT
GND.SCREW
LINE IN - L1
LINE IN - L2
LINE IN - GND
SERVICE PROVIDED INPUT
EXT. BLOWER OR CONTACTOR
115V- BLACK
230V- BROWN
115V- WHITE
230V- BLUE
BLACK
WHITE
BLACK
WHITE
BLOWER
MONITOR
LIGHT
LIGHT
LIGHT
SERV. LIGHT
HARNESS:
115V 9946300
230V 9946301
AIR MONITOR
USER SELECTED
OUTLET
OUTLET
SINGLE POINT JUNCTION BOX
LIGHTS/AIR MONITOR/RECEPTACLES/BLOWER
BLOWER
MONITOR
BLOWER SWITCH
BLACK
BLACK
WHITE
WHITE
POWER
SUPPLY
OPTIONAL
USER SELECTED
RECEPTACLE/20A
P/N 9947XX
OPTIONAL
AIR MONITOR
LIGHT SWITCH
BLACK
WHITE
SERV. LIGHT
BLACK
WHITE
FLUORESCENT LIGHT FIXTURE
10,12,16 FT.
FLUORESCENT LIGHT FIXTURE
4,5,6,8 FT.
WARNING
DISCONNECT FROM POWER SOURCE
PRIOR TO SERVICING UNIT
Protecting your laboratory enviroment
LABCONCO
WIRING DIAGRAM
PROTECTOR XL HOOD
115V/60 HZ. 230V 50/60 HZ.
P/N 9945900 REV. -

Appendix D: References

Many excellent reference texts and booklets are currently available. The following is a brief listing:

Laboratory Ventilation Standards

Federal Register 29 CFR Part 1910
Non-mandatory recommendations from "Prudent Practices."

- Fume hoods should have a continuous monitoring device
- Face velocities should be between 60-100 linear feet per minute (lfpm)
- Average 2.5 linear feet of hood space per person

Occupational Health and Safety
U.S. Department of Labor
200 Constitution Avenue N.W.
Washington, DC 20210
(202) 523-1452

Industrial Ventilation-ACGIH

- Fume hood face velocities between 60-100 lfpm
- Maximum of 125 lfpm for radioisotope hoods
- Duct velocities of 1000-2000 fpm for vapors, gasses and smoke
- Stack discharge height 1.3-2.0 x building height
- Well designed fume hood containment loss, <0.10 ppm

Industrial Ventilation: A Manual of Recommended Practice,
25th Edition, 2004
American Conference of Governmental Industrial Hygienists
1330 Kemper Meadow drive
Cincinnati, OH 45240-1634
(513) 742-2020

ASHRAE 110-1995 Method of Testing Performance of Fume Hoods
Evaluates fume hood's containment characteristics
- Three part test: Smoke generation, Face velocity profile, Tracer gas release @ 4 liters per minute
- Rated As Manufactured (AM), As Installed (AI) and As Used (AU)

American Society of Heating, Refrigerating, and Air Conditioning Engineers
1791 Tullie Circle N.E.
Atlanta, GA 30329
(404) 636-8400

ANSI Z9.5-2003 Laboratory Standard
Covers entire laboratory ventilation system.
- Vertical stack discharge @ 2000-3000 fpm
- New and remodeled hoods shall have a monitoring device
- Ductless hoods should only be used with non-hazardous materials
- Fume hood face velocities between 80-120 fpm

American Industrial Hygiene Association
2700 Prosperity Avenue, Suite 250
Fairfax, VA 22031
(703) 849-8888

SEFA 1-2002
- Fume hood face velocities based on toxicity levels of chemicals
  Class A – 125 to 150 fpm
  Class B – 80 to100 fpm
  Class C – 75-to 80 fpm
- Test method – face velocity profile and smoke generation

Scientific Equipment & Furniture Association
1028 Duchess Drive
McLean, VA 22102
(703) 538-6007

NFPA 45 – 2002 Fire Protection for Laboratories Using Chemicals
- Laboratory hoods should not be relied on for explosion protection
- Exhaust air from fume hoods should not be recirculated
- Services should be external to the hood
- Canopy hoods only for non-hazardous applications
- Materials of construction should have flame spread of 25 or less
- 80 to 120 fpm to prevent escape

NFPA 30 – 2000 Flammable and Combustible Liquids Code
- Approved cabinets may be metal or wood
- Vent location on cabinets are required
- Venting of cabinets not a requirement

National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
(800) 344-3555

General References

ASHRAE Standard Committee. *ASHRAE Standard* Atlanta: ASHRAE Publications Sales Department, 1995

British Standards Institution*, Laboratory Fume Cupboards*. Parts 1, 2 and 3, London: 1990

Department of Labor, Occupational Safety and Health Administration, *29 CFR Part 1910, Occupational Exposures to Hazardous Chemicals in Laboratories, Final Rule*. Vol. 55, No. 21. Washington D.C.:1990

DiBerardinis. L. et al. *Guides for Laboratory Design, Health and Safety Considerations*. Wiley & Sons, 1987

McDermott, Henry, *Handbook of Ventilation for Contaminant Control*, *2nd Edition*. Butterworth Publishers, 1985.

Miller, Brinton M. et al. *Laboratory Safety: Principles and Practices.* American Society for Microbiology, Washington, D.C.: 1986

NIH Guidelines for the Laboratory Use of Chemical Carcinogens. NIH Publication No. 81-2385.

Rayburn, Stephen R. *The Foundation of Laboratory Safety, A Guide for the Biomedical Laboratory*. Springer-Verlag, New York: 1990

Sax, N. Irving and Lewis, JR., Richard J. *Rapid Guide to Hazardous Chemicals in the Workplace*. Van Nostrand Reinhold, 1987.

Schilt, Alfred A. *Perchloric Acid and Perchlorates*. The G. Frederick Smith Chemical Company, Columbus, OH: 1979.

Furr, A. Keith. *CRC Handbook of Laboratory Safety, 5th Edition*. CRC Press, 2000.

DECLARATION OF CONFORMITY

Application Council Directive(s): 73/23/EEC, 89/336/EEC, 2002/95/EC (ROHS), 2002/96/EC (WEEE), 2004/108/EC

Standard(s) to which conformity is declared: EN61010-1, EN61326-1, EN55022, EN61000-3-2/3

Manufacturer's Name: Labconco Corporation

Manufacturer's Address: 8811 Prospect Avenue
Kansas City, MO 64132 USA

Importer's Name: See Shipping/Customs Documents

Importer's Address: See Shipping/Customs Documents for your equipment

Type of Equipment: Laboratory Equipment Protector Laboratory Hoods

Model No.:

Premier Models	48700 Series thru 48800 Series 4' Protector Laboratory Hoods 60700 Series thru 60800 Series 5' Protector Laboratory Hoods 72700 Series thru 72800 Series 6' Protector Laboratory Hoods 9674500, 9683000 8' Protector Laboratory Hoods
XL Models	97001, 97002, 97003, 97004 Series Protector Laboratory Hoods 97504, 97505, 97506 Series Protector Laboratory Hoods
XLE Models	99704, 99705, 99706, 99707, 99708 Series Protector Laboratory Hoods

Serial No.: Various – See Individual Declaration

Year of Manufacture: 2002 and subsequent

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

See individual Declaration of Conformity which will be signed by the importer for your country.

Place: _____
(Signature)

Date: _____
(Full Name)

_____
(Position)

Labconco P/N 36960-23, Rev. C, ECO E344